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Behavioral Pharmacy

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3: Social Epidemiology and Public Health Pharmacy. Social consequences of drug use. Sociological aspects of poison control. Social epidemiologic studies of drug-related accidents, morbidity, and mortality (e.g., suicides due to drug overdose). Community approaches to the prevention and control of drug-related problems. Social and cultural attitudes toward the use of pesticides and other chemical agents which may endanger the public's health.

4: The Sociology of Pharmacy Practice. The changing role of the pharmacist. Factors affecting pharmacists' choice of practice setting and career options. Sources of job satisfaction and dissatisfaction. How other health professionals and the public define the role of the pharmacist. Sources of consumer satisfaction and dissatisfaction. How the nature and quality of pharmaceutical services are influenced by the structure of medical practice, payment mechanisms, the expectations of patients and physicians, professional codes of ethics and peer pressure, and by other formal and informal mechanisms of social control. The nature and impact of professional organizations. The distribution of pharmaceutical services. Pharmacists' relationships with hospital and nursing home administrators. Barriers to the coordination of medical and pharmaceutical services. Sources of resistance

to change in pharmacy practice. The effect of various organizational settings upon pharmacists' attitudes and performance. Factors affecting pharmacists' compliance with laws.

5: The Sociology of Pharmacy Education. Factors affecting student interest in pharmacy, the recruitment and selection of students, and the socialization of pharmacy students. Issues regarding the distribution of minorities and women. Factors affecting students' self-concept, professional orientation, and attitudes toward their future work. How externship, internship, and clerkship programs affect the student and the quality of pharmaceutical services. Sociological issues regarding the continuing education of pharmacists. How the structure of pharmacy education affects the nature and quality of services provided to the public.

6: The Sociology of the Pharmaceutical Industry. Social issues regarding drug research, drug development, drug marketing, and drug evaluation. How advertising and promotion affect medical decision-making. The diffusion of innovation. How pharmaceutical companies relate to government officials and agencies, the medical and pharmacy professions, researchers, and the public. The impact of pharmaceutical advertising upon consumers' use of over-the-counter products.

Behavioral Pharmacy

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In the text that follows, the development of a coherent and recognizable teaching and research field devoted to the development of the behavioral and social sciences in pharmacy is proposed. It is important for teachers and researchers in this field to establish a common and recognizable identity; to share basic definitions, purposes and criteria; and to develop forums (such as scientific meetings and perhaps a journal) for the exchange and nourishment of the behavioral science knowledge that they generate. It is suggested that this field be called behavioral pharmacy. This title is suggested primarily because of recent participant agreement and NIH legitimization given to the title "behavioral medicine" for a closely allied field concerned with behavior and health(1).

The 1976 report of the Study Commission on Pharmacy, better known as the Millis Commission Report, called attention to the need for developing the behavioral and social sciences in pharmacy(2):

"The Study Commission emphasizes that pharmacy is a knowledge system in which *chemical substances and people called patients* interact. Needed and optimally effective drug therapy results only when the drugs and those who consume them are fully understood. We suggest that one of the first steps in reviewing the educational program of a college of pharmacy should be weighing the relative emphasis given to the physical and biological sciences against the behavioral and social sciences in the curriculum for the first professional degree."

The recommendations of this report reflect rapidly growing concern within pharmacy, as within the other health professions, about the need to apply behavioral science knowledge to health care.

Behavioral pharmacy is distinct from, although it overlaps with, behavioral medicine, psychosomatic medicine, psychopharmacology, medical sociology, medical anthropology, health psychology, medical economics, and educational research in pharmacy. The following

definition is proposed:

"Behavioral pharmacy is the field concerned with the *development* of behavioral science knowledge and techniques relevant to the understanding of drug use, drug effects, drug selection and prescribing, behavioral-therapy adjuncts and alternatives to drug therapies, the professional behavior and well-being of pharmacy practitioners, and the *application* of this knowledge and these techniques to prevention, diagnosis, treatment and rehabilitation."

Having proposed this very general definition of behavioral pharmacy, what is taught will now be specified, followed by a discussion of the scientific nature of what is taught.

TEACHING BEHAVIORAL PHARMACY

A well-rounded behavioral pharmacy curriculum would include the application of behavioral science knowledge to the following areas. The list is not exhaustive, but it is believed that each of these areas is important to include in the behavioral pharmacy curriculum.

At the micro level, behavioral pharmacy should stress each of the following:

- (i) Patient education and motivation.
- (ii) Patient adherence to prescribed medicine regimens and the pharmacist's role in patient compliance.
- (iii) Psychological aspects of rational drug therapy.
- (iv) Minimal environmental conditions necessary for effective professional pharmacy, including the impact of privacy, noise and professional surroundings on the behavior of both practitioner and client.
- (v) The pharmacist's role in an holistic approach to health.
- (vi) Stress management, including the use and dangers of the

minor tranquilizers, and alternatives to drugs for stress management.

- (vii) Maximizing intended drug effects and minimizing unintended effects.
- (viii) Drug misuse and abuse.
- (ix) Management of chronic and acute pain.
- (x) Illness perception and attributions of causality.
- (xi) Satisfaction, productivity and well-being among pharmacists.
- (xii) Psychosomatic disorders.
- (xiii) Pharmacy ethics.
- (xiv) Drug use problems in the elderly.
- (xv) The pharmacist's role in dealing with death and the dying person.

At the macro level of analysis, it is believed to be important to include:

- (i) Social systems and disease.
- (ii) The impact of the health profession on health behavior.
- (iii) The study of alternative health-care delivery systems.
- (iv) Unorthodox health-care systems.
- (v) Organization within the drug-use domain: who does what and why.
- (vi) Epidemiology of drug use and misuse.
- (vii) Politics of health.
- (viii) Culture: its role in shaping the system of care for a population.
- (ix) Effecting change in organizations.
- (x) Competition: positive and negative features.
- (xi) Economic obstacles to and advantages of holistic pharmacy.

In behavioral pharmacy, empirical findings and theories from the behavioral and social sciences are taught and their applications to pharmacy are addressed. Some of the empirical findings that are taught can be characterized as scientific, while others are best described as pre-scientific in that they are purely descriptive. Similarly, some of these theories qualify as scientific, while others do not.

Examples of some more widely celebrated descriptive findings in behavioral pharmacy are: beneficial effects occur with about one out of every three placebo administrations, noncompliance rates run about 35 percent on the average, and certain ethnic groups are notably more stoic than others. Examples of scientific data include findings that compliance is greater where the perceived efficacy of the drug is greater, the cost is low, and the illness is severe. The latter examples are scientific and the previous examples are descriptive, because the latter findings, unlike the former, derive from and either corroborate or disconfirm scientific theory.

Popular nonscientific theories include the sick role model of Parsons(3), the lay referral system of Freidson(4), the illness stage model of Suchman(5), Herzberg's two-factor theory of employee satisfaction(6), and Maslow's hierarchical theory of motivation(7). By calling these theories nonscientific, it is not intended to discredit them but rather it is wished merely to draw attention to the fact that they are largely nonveridical; that is, they are not amenable either to corroboration or to disconfirmation by empirical test, because they tend not to generate testable hypotheses.

The nonscientific social theories which are taught, like the descriptive data that are cited, have their usefulness within a limited context. The nonscientific theories and descriptive data serve by plugging in the holes where one needs to know but frankly does not, and as such provide reasonable heuristic guidelines or assumptive bases for action in the absence of scientific understanding. Professors of behavioral science, however, should take care to recognize that these nonscientific theories often are little more than truisms. Since they cannot be proven as either "correct" or "incorrect," these theories are of limited value; their contribution to knowledge is much less than it seems. Similarly, descriptive data tell one how many, what proportion, how much, and relative to what, but since they do not say why or how, they fail to enlighten one's understanding very much. The goal of social and behavioral scientists should be to expand scientific understanding to replace these heuristics whenever and wherever possible.

Efforts should be made to replace nonscientific theories with equally general and hence equally useful, but more veridical and more predictive, scientific theories based on good scientific research.

Among the scientific theories which are taught at present are the value and expectancy models of human motivation, including the social learning theories of Rotter(8) and Bandura(9), the health belief model of Rosenstock, *et al.*(10), the gating theory of pain by Melzack and Wall(11), and the attribution theories by Jones and Davis(12), Kelley(13), Jones, *et al.*(14), Schachter(15) and Bem(16).

It is true that pragmatists tend to despair of scientific theories (especially good scientific theories) because they seem too often not to hold up under the data they generate. But it is precisely because they do generate disconfirming (and occasionally corroborating) data that these theories are valuable. It is through the elaboration, transformation and replacement of scientific theories following disconfirmation by scientific research that one advances one's understanding. One should not yield to the temptation to teach less scientific theory in favor of more nonscientific theory because the latter is less vulnerable to disconfirmation.

While it is important to teach from good scientific theory, this does not mean that in teaching professional students it is advisable to teach to theory. It is better to teach to problems in pharmacy practice, for example, making therapeutic judgements, communicating with clients and colleagues, activating the patient, choosing strategies for pain management, motivating the employee, *etc.* The student will learn more and incorporate behavioral science technologies better into his practice if the teacher teaches to realistic professional problems from good scientific theory. This occurs best, perhaps effectively only, when combined with opportunities for developing and sharpening judgemental and motor skills in well-supervised clinical settings. Behavioral pharmacy should be taught nearly always in conjunction with clinical practice.

BEHAVIORAL PHARMACY RESEARCH

The first and most telling argument for behavioral pharmacy research by teachers of the field is the need to generate behavioral knowledge and techniques especially for pharmacy. The Millis Commission created the mandate to develop behavioral and social science curricula in colleges of pharmacy, but stopped short of defining what is to be taught from the behavioral sciences. A wise decision. It is easy to recognize the more glaring behavioral needs of pharmacy, but far more difficult to find existing scientific behavioral knowledge to solve these problems. The National Institute of Child Behavior and Human Development has decided, for example, to spend the more than six million dollars allocated to them by HEW for research on smoking and health in adolescents on basic research in the social and psychological factors which encourage and deter adolescent smoking. Although HEW Secretary Califano urged that demonstration anti-smoking programs be supported in schools, it was decided that not enough is known yet about the relationships between psychosocial variables and tobacco use to implement sophisticated technology in the schools. In contrast to this more cautious approach, the Mr. Yuk campaign was inaugurated with considerable enthusiasm to deter the accidental consumption of toxic chemicals by young children. The need for such a campaign is real. However, little or nothing is known about how the particulars of this campaign might motivate children in complex social situations; whether, for example, the Mr. Yuk stickers might arouse greater curiosity than avoidance where they are not accompanied by parental reinforcement.

In the case of both school smoking prevention programs and the Mr. Yuk campaign, the temptation is to claim more than is known. In short, there is not a behavioral science knowledge sufficiently focused to the needs of the field to support a sophisticated behavioral pharmacy technology today. A knowledge base for behavioral pharmacy must be developed, both at the basic and the applied levels.

The knowledge base that is developed through behavioral pharmacy research should meet several criteria: it should relate to drugs and the drug professions, to the consumers of drugs, and to the wellness behaviors that the pharmacist can reasonably expect to affect (*e.g.*, smoking and eating patterns). Wellness behavior includes concern with certain categories not commonly thought of as drug behaviors.

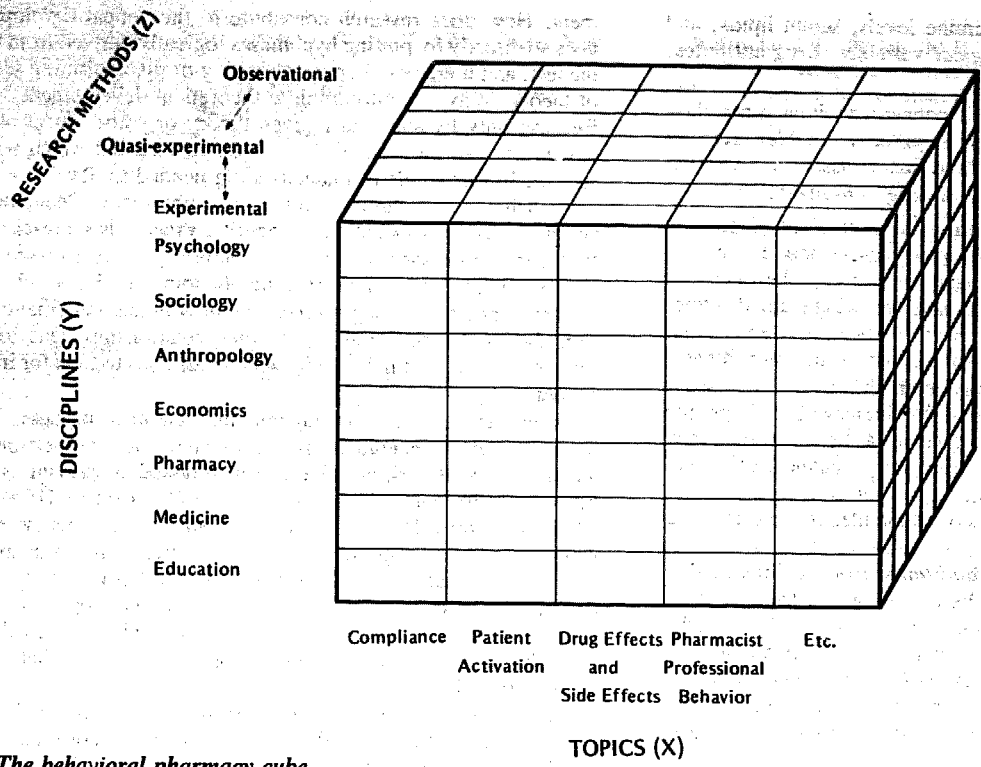


Fig. 1. The behavioral pharmacy cube.

However, as the National Institute of Drug Abuse has recently extended its concern to include all classes of obsessive consumatory behavior, including smoking and overeating, so too should pharmacy enter this area of national concern with primary prevention. Behavioral pharmacy should draw from and build upon the knowledge and methodologies of the behavioral sciences. It should be scientific. In light of these criteria, behavioral pharmacy research can be defined in terms of the topics it addresses, the disciplines it encompasses, and the methods by which it generates knowledge. This scheme is depicted graphically in Figure 1.

Some examples of behavioral pharmacy research from the Social and Administrative Pharmacy program at Minnesota are cited to demonstrate discrete topic by discipline by method intersections in the research cube. Research by Maiman and her colleagues on the health belief model as a predictor of patient compliance might fall into a compliance/sociology/quasi-experimental cell(17). Zander's participant observation research on the socialization of pharmacy students might be described by a pharmacist professional behavior/anthropology/observational-method intersection.¹ The research by Beardsley *et al.* on the effects of education and privacy on compliance falls into the compliance/psychology/experimental cell. Curtiss'(19) and Hammel's(20) work on the effects of role expectations on practitioner well-being belongs in the professional behavior/pharmacy/quasi-experimental and professional behavior/psychology/quasi-experimental cells. Bootman's research on the effects of a pharmacokinetics program on patient outcomes in a burn treatment center belongs in the drug effects/pharmacy/quasi-experimental cell(21). Obviously, the combinations are numerous, but some cells are empty and will probably remain so. For example, experimental anthropological research in anything would be a self-contradiction.

To better appreciate the scope of this task, it is helpful to consider in finer resolution the topics of behavioral pharmacy research. What research variables are likely to be pursued productively? Figure 2 presents a matrix suggesting one way of constructing the family of research variables relevant to behavioral pharmacy. Variables may be classified first by the level at which they are analyzed. For example,

locus of control, intelligence, and body weight are *individual difference* variables. Socio-economic status, family size, group memberships, and cultural norms are *social and cultural* variables. Third-party payment systems, organizational hierarchy, and legislative con-

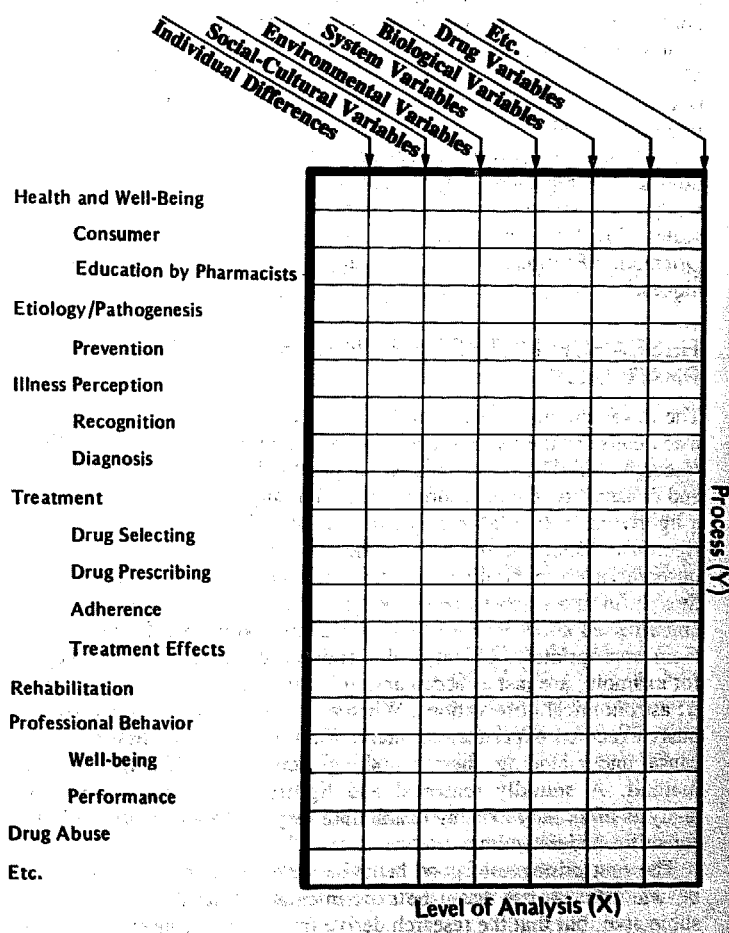


Fig. 2. The behavioral pharmacy variable matrix.

¹ Zander, D., "The Student Pharmacist's Reality: A Phenomenological Approach to Evaluation," paper presented to the annual meeting of the American Anthropological Association, Houston TX, November/December 1977.

tol are *systems* variables. Catecholamine levels, serum lipids, and cell receptor characteristics are *biological* variables. Drug attributes, dosage, and form are *drug* variables.

Behavioral pharmacy research also is concerned with another class of variables which might be described as process variables. Among the process variables are indicators of and factors associated with the overall *health and sense of well being* of drug consumers.

Etiology, pathogenesis and prevention is another set of process variables which concern behavioral pharmacy researchers. For example, at the University of Minnesota, the relationships between job stress, drug use, and cardiovascular disease are being studied. Other process variables include the instructional, expectancy, and social variables which affect a person's *perception* of his/her own illness, and the variables which affect the physician's *diagnosis* of disease (Hurd, for example, is exploring a possible defensive bias of people with chronic limitations to perceive themselves as better off than they are). *Treatment* variables (choices of treatment, treatment effectiveness, adherence, etc.) are one other class of process variables (Huang's recent research on the effects of ethnic identity on OTC drug use is an example)(22).

Other process variables include *rehabilitation* from debilitating disorders such as strokes, heart attacks, burns and other accidents; *drug abuse*, its causes and effects (Sternbach, for example, has designed a program to evaluate the effectiveness of various alcoholism treatment programs on patient outcomes²); *professional behavior* and outcomes, such as indicators of quality of professional performance and professional vitality and the rate of pharmacist attrition (research by Kabat, *et al.* is an example)(23).

Other examples of behavioral pharmacy research at the University of Minnesota and their location in the grid depicted in Figure 2 are Smith's attempt to put Freidson's lay referral system to a scientific test (illness perception/treatment by social variables interaction)(24) and Lambert's research on drug knowledge and OTC use (individual difference by treatment interaction)(25). Other examples are Wertheimer and Maiman's study on the effects of pharmacists' attitudes on contraceptive advice given to patients (professional behavior/treatment by individual difference/environment interactions)³ and Manasse's pioneering research on socialization in pharmacy school (individual difference/culture/environment by professional behavior interaction)(26).

Psychometric instrument development and methodological innovations are not represented in the matrix. Some examples include Cyrs' work on assessment centers,⁴ Grussing's behaviorally-anchored rating scales(27), Johnson, *et al.*'s development of the General Person Orientation Profile(28) and Bush's applications of path analysis techniques.⁵

RESEARCH METHODS FOR BEHAVIORAL PHARMACY

The development of behavioral science knowledge relevant to pharmacy calls for the use and elaboration of a large number of scientific research methods. Depending on the practical and ethical possibilities and constraints, the appropriate method at any given moment may be a tightly controlled laboratory experiment, a less well-controlled but rigorously designed quasi-experimental intervention, or systematic observations of naturally occurring social and health phenomena. The thoughtful and rigorous behavioral pharmacy researcher need not be embarrassed about less well-controlled methodologies if he/she uses them appropriately. Scientifically conceived and executed surveys, for example, are just as acceptable scientific methods as are systematic astronomical observations. Whereas the well-conceived and rigorously executed experimental intervention is always the best route to causal understanding, there is nothing sacred about the experimental method. A soundly reasoned and tightly constructed secondary analysis of already existing health data may contribute appreciably to scientific understanding.

The first principle of good behavioral pharmacy research is that it be scientific — not that it be experimental or that the data be non-subjective, but that the research derive from and be conceived so that it can be reasonably expected to contribute to theoretical develop-

ment. How does it contribute to theoretical development? It does so directly by putting hypotheses logically derived from theory to the test, and thereby either corroborating or disconfirming some point of theory. Why is contributing to theoretical development desirable? Because only by showing a given theory or some aspect of it to be inadequate can more valid theories be constructed which will represent the higher levels of understanding needed to develop a sophisticated behavioral technology relevant to pharmacy. Phenomenon description, like rationalistic nonscientific theory, is a prescientific activity. It is necessary for and is the natural precursor of science. But once something is known about the phenomena with which a science is to be concerned, thoughtfulness about why and systematic speculation about relevant variables and their relationships lead to testable hypotheses and help in knowing which variables to look for from there on out.

Description is useful throughout the scientific process. But it is never enough. Conceptually isolated frequencies, proportions, ratios and qualitative descriptions have been amassed in dizzying quantities, but with little real enlightenment. The indictment of USA research laboratories by a British statistician holds true for behavioral pharmacy: "American laboratories are characterized by reams and reams of data untouched by human minds." It is time for us to move into a period of intense science in which we rigorously apply our minds to the data we collect and, in turn, see to it through sound methodology that subsequent research data are applied to the test of what our minds have produced.

Research should be turned away from what is essentially descriptive. Not that descriptive data should never be collected, but this should be done for a time only in service of theory development. By this is meant that purely descriptive (non-hypothesis-testing) data ought now and for a while to be collected only for the clearly stated purpose of exploring additional variables not considered by existing or new scientific theory. Theory-enriching descriptive data might also be collected in conjunction with hypothesis-testing research. For example, while testing the hypothesis that locus of control interacts with patient education programs to affect compliance, one might also, for no well-articulated theoretical reason, see if level of educational attainment accounts for a significant proportion of the variance in compliance. The advantage of "throwing in" the educational attainment variable into a theoretically derived experimental test (as opposed to going after it in a haphazard multivariate way) is that one might be led by the theory (and the research method appropriate to test the theory) to look for interactions between education and the experimental variables — interactions that might otherwise obscure relationships between education and compliance in a correlational or regression analysis.

It is time now for behavioral pharmacy formally to recognize itself as an academic and a research discipline and, in so doing, to turn away from its prescientific phase to enter with full commitment into the scientific phase of its development. This will be done by emphasizing hypothesis generation and testing (as opposed to descriptive research in what we do and teach) and by establishing for ourselves a common identity, characterized by widely accepted definitions and visible forums for the exchange of information about the developments in this most important field.

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References

- (1) Schwartz, G.E. and Weiss, S.M., *J. Behav. Med.*, 1(1), 3(1978).
- (2) *Pharmacists for the Future*, Health Administration Press, Ann Arbor
- (3) Stergachis, A., unpublished manuscript, St. Louis Park Medical Center, St. Louis Park MN 55416.
- (4) Wertheimer, A.I. and Maiman, L.A., unpublished manuscript, College of Pharmacy, University of Minnesota, Minneapolis MN 55455.
- (5) Cyrs, T., "Issues and Assessment and Training for Professional Competence," paper presented to the American Psychological Association, Toronto, Ontario, Canada, August 1978.
- (6) Bush, P.T. and M. Osterweis, M., "Pathways to Medicine Use," paper presented at the annual meeting of American Public Health Association, Miami FL, October 1976.

- MI (1975) p. 142.
- (3) Parsons, T., *Patients, Physicians and Illness*, The Free Press, New York NY (1958) p. 176.
 - (4) Freidson, E., *Patients' Views of Medical Practice*, Russell Sage Foundation, New York NY (1961) p. 146.
 - (5) Suchman, E.A., *J. Health Hum. Behav.*, 6, 114(1965).
 - (6) Herzberg, F., *Harvard Bus. Rev.*, 46, 53(1968).
 - (7) Maslow, A.H., *Motivation and Personality*, Harper, New York NY (1954).
 - (8) Rotter, J.B., *Social Learning and Clinical Psychology*, Prentice Hall Inc., Englewood Cliffs NJ (1954).
 - (9) Bandura, A., *Social Learning Theory*, Prentice Hall, Englewood Cliffs NJ (1976).
 - (10) Rosenstock, I.M., *Milbank Mem. Fund Q.*, 44(3), 94(1966), pt. 2.
 - (11) Melzack, R. and Wall, P.D., *Science*, 150, 971(1965).
 - (12) Jones, E.E. and Davis, K.E. in *Advances in Experimental Social Psychology, Volume 2*, Education Academic Press Inc., New York NY (1965) pp. 219-266.
 - (13) Kelley, H.H. in *Nebraska Symposium on Motivation* (edit. Levine, D.), University of Nebraska Press, Lincoln NE (1967) pp. 192-238.
 - (14) Jones, E.E., Kanouse, D.E., Kelley, H.H., Nisbett, R.W. and Weiner, B., *Attribution: Perceiving the Causes of Behavior*, General Learning Corp., Morristown NJ (1972).
 - (15) Schacter, S. in *Feelings and Emotions* (edit. Arnold, M.G.), Academic Press Inc., New York NY (1970) pp. 111-121.
 - (16) Bem, D.J. in *Advances in Experimental Social Psychology, Volume 6*, Education Academic Press Inc., New York NY (1972) pp. 1-62.
 - (17) Kirscht, J.P., Becker, M.H., Haefner, D.P. and Maiman, L.A., *J. Behav. Med.*, 1(2), 147(1978).
 - (18) Beardsley, R.S., Johnson, C.A. and Wise, G., *J. Am. Pharm. Assoc.*, NS17, 366(1977).
 - (19) Curtiss, F.R. and Johnson, C.A., *Am. J. Pharm.*, 149(6), 157(1977).
 - (20) Hammell, R.J., Johnson, C.A. and Heinen, J.S., *Am. J. Hosp. Pharm.*, 34, 241(1977).
 - (21) Bootman, J.L., Wertheimer, A.I., Zaske, D. and Rowland, C., *J. Pharm. Sci.*, 68, 267(1979).
 - (22) Huang, W.F., *A Study of Ethnicity and Nonprescribed Medicine Consumption*, Doctoral dissertation, The University of Minnesota, Minneapolis MN (1979).
 - (23) Clinite, J.C. and Kabat, H.F., *J. Am. Pharm. Assoc.* NS16, 74(1976).
 - (24) Smith, M.I., *An Examination of the Lay Referral System as Applied to the Perceptions of Quality of Pharmaceutical Services*, Doctoral dissertation, The University of Minnesota, Minneapolis MN (1979).
 - (25) Lambert, R., *Nonprescription Drug Users' Knowledge of Agents Used in Medically Unsupervised Therapy*, Doctoral dissertation, The University of Minnesota, Minneapolis MN (1979).
 - (26) Manasse, H., Kabat, H.G. and Wertheimer, A.I., *Soc. Sci. Med.*, 11, 653(1977).
 - (27) Grussing, P., *Development and Validation of Measures for the Assessment of Competency in Pharmacy Practice*, Doctoral dissertation, The University of Minnesota, Minneapolis MN (1978).
 - (28) Johnson, C.A. and Church, T., *Social Curriculum Project, College of Pharmacy*, University of Minnesota, Minneapolis MN (1977).

Pharmaceutical Psychology

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A more appropriate title for this paper would be "Pharmaceutical Psychology — Is There One?" Applications of psychological principles to pharmacy issues have been described, discussed and analyzed in the pharmacy literature but those issues which might comprise the discipline of pharmaceutical psychology have been scattered throughout the various pharmacy journals. This body of knowledge is incomplete, disconnected and unstructured. By completing, connecting and structuring this information, the parameters, functions and idiosyncracies of this new aspect of pharmacy might become apparent. Or they might not. It is possible that pharmaceutical psychology as a discipline is an illusion — a relabeling of some issues and techniques that exist legitimately on their own, or which might be subsumed under health services research.

The purpose of this paper is to define those areas that could comprise pharmaceutical psychology so that an objective analysis and evaluation of the validity of this aspect of behavioral pharmacy can begin. This paper will include: (i) a review of the literature on the application and analysis of psychological principles to issues in pharmacy; (ii) an outline of additional areas in pharmacy in which psychologists could become involved; (iii) a description of a project involving the application of prose learning to the design of patient package inserts; and (iv) an analysis of the concept of pharmaceutical psychology.

LITERATURE REVIEW

The review of the literature included articles listed in *International Pharmaceutical Abstracts*, from January 1974 to February 1978, under the headings of: (i) *Sociology, Economics and Ethics*, (ii) *Pharmacy Practice* and (iii) *Information Processing*.

Articles under the heading of *Pharmacy Education* were not searched. Ninety-nine articles were identified which involved the application or analysis of psychological principles to issues in pharmacy. Articles involving sociological issues (e.g., race relations, drug abuse), economics (e.g., cost effective studies) and marketing (e.g., humor in advertising) were excluded. Articles which involved communication between pharmacists and patients but which focused primarily on medication information rather than aspects of communication were also excluded from this bibliography. The breakdown of categories is presented in Table I.

The major issue discussed in these articles was communication with patients and other health professionals (45 percent). Thirteen of the 45 articles were non-specific in regard to illness and type of patient. Twenty-five of the 45 were geared towards communication with patients who had specific health problems, primarily hypertension. Seven were geared towards specific populations, e.g., children or the elderly. Communication with other health professionals, primarily physicians, was the topic of seven articles. Issues of patient information and patient compliance comprised 25 and 24 percent of the articles. The remaining five percent were concerned with pharmacists themselves; three were on women in pharmacy, one on self-management skills for pharmacists and one on characteristics of pharmacists.

This list is not to be considered exhaustive, for at least two reasons: (i) the criteria used for inclusion or exclusion were flexible, and (ii) many articles involving psychological principles which were listed under pharmacy education or other areas were not included in this search.

The list does, however, give an idea of the direction of psychology

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University of Wisconsin-Madison

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